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Section: Original Research

Article Title: Self-Efficacy, Physical Activity and Sedentary Behavior in Adolescent Girls: Testing Mediating Effects of the Perceived School and Home Environment

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Self-efficacy, physical activity and sedentary behavior in adolescent girls: Testing mediating effects of the perceived school and home environment

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Abstract

Background: According to social-cognitive theory (SCT), self-efficacy affects health behavior both directly and indirectly by influencing how individuals perceive their environment. This study examines whether perceptions of home and school environment mediate the association between self-efficacy and physical activity (PA) and sedentary behavior in adolescent girls. **Methods:** Baseline data from the Nutrition and Enjoyable Activities for Teen Girls (NEAT) was used for this study. Grade 8 female students (n=357) were recruited from 12 secondary schools located in low-income communities in the Hunter Region, New South Wales, Australia. PA was assessed using accelerometers, and sedentary behavior by self-report and accelerometers. Self-reported measures were used for perceived home and school environment and self-efficacy. Multi-level regression models were calculated to determine if the perceived environment mediated the relationship between self-efficacy with both PA and sedentary behavior. **Results:** The perceptions of the school and home environment did not mediate the relationship between PA self-efficacy and PA behavior or sedentary behavior. **Conclusion:** The mediated models were not supported for PA or sedentary behavior. However, other results of this paper may be helpful for future theory development and practice. More research is needed to understand behaviors in unique populations such as this.

Keywords: Physical activity, sedentary behavior, environment, social-cognitive theory

Background

Physical Activity (PA) is associated with numerous health benefits.¹ For children and adolescents it is of particular relevance that PA promotes healthy growth and positively affects social² and cognitive development.³ However, in most countries a vast majority of children and adolescents are not sufficiently active.⁴⁻⁶

Sedentary behavior is a unique health risk factor (independent of PA)⁷ and refers to sitting behavior that requires very little energy expenditure. It occurs in different settings throughout the day such as at home, for transport, at work or at school.⁸ Over the last few decades, sedentary behavior among young people has increased dramatically,⁹ posing a public health risk in both developed and developing countries. Sedentary behavior is an emerging risk factor of compromised metabolic health and chronic diseases.¹⁰ Perhaps the most serious immediate consequences of increased sedentary behavior in youth are psychosocial, as high screen use has been linked to low self-esteem^{11,12} poor quality of life¹³ and depression¹² in young people.

PA declines and sedentary behavior increases during adolescence,¹⁴ and both trends are more pronounced in adolescent girls.^{4,14} Further, health behaviors that develop during childhood and adolescence are likely to continue into adulthood.^{15,16} There is also evidence that socioeconomic status is related to levels of PA in young people.^{17,18} In particular, adolescent girls living in low income communities are less active than girls residing in mid and high income areas.¹⁹ Hence, there is an urgent need for interventions to increase PA and decrease sedentary behavior in youth, especially for girls from low socioeconomic backgrounds.

A prerequisite for effective design and implementation of health promotion interventions is the identification of factors and underlying mechanisms that influence targeted health behaviors.²⁰ Research has shown that aspects of home, neighborhood, and

school environments are associated with PA in young people.²¹⁻²³ A few studies have also investigated the relationship between the built environment and sedentary behavior.

However, this area is understudied and in the few studies that have been conducted, most of the associations were not significant.²⁴⁻²⁶ The lack of significant association might be a result of unmatched environmental attributes and sedentary behavior outcomes. Another limitation of current research on environment and PA/sedentary behavior is the lack of understanding of the mechanism of association. Previous syntheses of the literature recommend better specified conceptual and statistical models that test the mechanisms of relationships, such as mediation models.²⁷

The importance of the environment is highlighted by the Social Cognitive Theory (SCT). One of the principles of SCT is ‘reciprocal determinism’ which states that the environment, the person and the behavior continuously influence each other.²⁸ SCT differentiates between the objective environment and situations, whereby the cognitive representation of the environment may affect behavior.^{28,29} The literature on spatial cognition and environmental psychology emphasizes that while people process, code and store information about their environment in cognitive maps, these are not necessarily accurate representations of their actual surroundings.³⁰⁻³³ Several studies found that in adults, there is a low agreement between perceived and objective measures of the environment³⁴⁻³⁷ and that environmental perceptions are more strongly associated with PA than objective measures.^{36,37} A recent study from the Netherlands also had similar findings for adolescents.³⁸

Self-efficacy has been proposed as the most important prerequisite of behavior change in SCT. The measurement of self-efficacy must be specific to the target behavior and to the barriers faced by the target group.²⁹ Self-efficacy is considered to be the most widely studied individual-level correlate of PA³⁹ and has been shown to be associated with both PA^{40,41} and sedentary behavior in children and adolescents.²⁴ Further, this construct is one of the only

longitudinal determinants to be consistently associated with physical activity in youth.⁴²

Bandura proposes that self-efficacy influences how people perceive obstacles and facilitators in their environment. Those with low self-efficacy are more likely to have negative views of their environment, while people with high self-efficacy are more likely to have positive environmental perceptions.⁴³ For example, two studies from Australia showed that adults with low self-efficacy for PA were more likely to have negative perceptions of an objectively measured high walkable neighborhood environment than those with high self-efficacy.^{34,36} Similarly, a study from Canada found that adolescents with low self-efficacy were more likely to perceive fewer opportunities for PA in their school environment compared to objective assessments.⁴⁴ Furthermore, Bandura states that self-efficacy affects health behavior both directly, and indirectly through its impact on perceptions of obstacles and facilitators in the environment. In other words, perceptions of the environment may mediate the relationship between self-efficacy and behavioral outcomes such as PA.⁴³

Examining the role of potential mediators has been one of the most cited future research directions in the relationship between environments and PA.^{21,45-49} Similarly, Baranowski and colleagues argue a need for a better evidence-base regarding mediators for PA change for interventions targeting children and adolescents.^{50,51} Most studies to date in this population have examined cognitive, behavioral and interpersonal mediators for PA.⁴⁹ Moreover, while self-efficacy and the built environment are some of the most widely studied correlates of PA, the interrelationship between the two has rarely been explored.³⁹ As previously mentioned, self-efficacy is hypothesized to influence perceptions of the environment which in turn are associated with PA. However, we are not aware of any other studies that have examined whether perceptions of the environment mediate the relationship between self-efficacy and PA.

The first aim of this paper was to determine if perceptions of the (i) home and (ii) school environment (examined separately) mediate the cross-sectional relationship between self-efficacy and PA in a sample of adolescent girls from low socioeconomic backgrounds. The second aim was to examine if perceptions of the environment ((i) home; (ii) school) mediate the relationship between self-efficacy and sedentary behavior in this target population.

Methods

Design

Data were used from the baseline survey of the Nutrition and Enjoyable Activities for Teen Girls (NEAT) study conducted in Newcastle, Australia. A detailed description of this study has been provided elsewhere.⁵² Briefly, NEAT Girls was a group-based randomized controlled trial (RCT) examining the effects of a 12-month school based intervention, targeting PA and nutrition behaviors of grade 8 female students from economically disadvantaged schools.⁵²⁻⁵⁴ Ethical approval for the study was given by the University of Newcastle and the New South Wales (NSW) Department of Education and Training Human Research Ethics Committees. School principals, parents and study participants provided written informed consent.

Participants

An index of socioeconomic disadvantage (Socio-Economic Indexes for Areas - SEIFA) was used to identify schools eligible for inclusion. SEIFA takes into account several socio-economic indicators of individuals and households in a specific area (e.g., employment, home ownership) and the score ranges from 1 (lowest SES) to 10 (highest SES). Public secondary schools in the Hunter Region and Central Coast areas of NSW with a SEIFA of ≤ 5 (bottom 50%) were considered for inclusion in the study. Twenty-six eligible schools were

identified. Of these, 18 were contacted and 12 successfully recruited. The range of SEIFA Indices (SI) were: SI-1 (n=1), SI-2 (n=4), SI-3 (n=3), SI4 (n=3), SI5 (n=1). The sizes of the 12 schools ranged from approximately 600-1300 students per school. Six schools were randomly allocated to the intervention and the other six served as control schools. Physical education teachers in the schools facilitated the recruitment of study participants. To be eligible students had to be females in grade 8 (12-14 years of age) who, as considered by their teachers, were disengaged in PE and/or not participating in organized sports. Physical education teachers at the study schools were asked to identify and invite 30 adolescent girls in Grade 8. Of the 12 study schools, 9 recruited 30 students while three schools recruited close to this quota with a final recruitment rate of 97.5%. Due to the recruitment protocol we are unable to report an accurate consent rate (i.e., percentage of consent letters returned divided by the number of consent letters distributed). Missing data were limited to less than 5%.

Measures

BMI

Height and weight were measured by trained research assistants. Weight was measured with a digital scale to the nearest 0.1kg and height was measured to the nearest 0.1cm using a portable stadiometer. BMI was calculated using the formula $(\text{weight}[\text{kg}]/\text{height}[\text{m}]^2)$ and further classified using age-specific percentiles.

Physical activity

Actigraph accelerometers (MTI models 7164, GT1M and GT3X) were worn by participants during waking hours for seven consecutive days, except while bathing and swimming. To improve compliance with the study protocols, participants were sent text messages each morning during the seven-day monitoring period to remind them to wear their accelerometers. Data were stored in 30-second epochs and the mean activity counts per

minute (CPM) were calculated. Age and gender specific cut-points were used to categorize PA into sedentary, light, moderate and vigorous intensity activity.⁵⁵

Studies have demonstrated that the output generated from the different Actigraph devices is comparable when assessing habitual physical activity.^{56;Dinesh, 2009 #2877} For example, a recent study by Dinesh and colleagues⁵⁷ demonstrated that there were no statistically significant differences between outputs from 7164, GT1M and GT3X accelerometers on walking and running tasks. Devices were subjected to inter- and intra-device reliability testing when first purchased, but not before they were used in the current study, as recently recommended.⁵⁸ Participants wore accelerometers, positioned on an elastic belt in front of the right hip, during waking hours for seven consecutive days. Trained research assistants explained the procedure and fitted the participants with accelerometers. Mobile phone text messages were sent to participants each morning to remind them to attach their accelerometers. Physical activity was categorized into sedentary, light, moderate and vigorous intensity activity using age and gender specific cut-points.⁵⁵ Participant data were included in the analyses if accelerometers were worn for ≥ 600 minutes on three or more days.⁴ To define non-wear time an interval of 20 consecutive minutes of zero activity counts was predetermined, an interruption interval of one minute of counts between 0 and 100 was permitted.

Sedentary behaviors

The Adolescent Sedentary Activity Questionnaire (ASAQ) was used to provide a self-report of time spent in sedentary behaviors.⁵⁹ The ASAQ requires respondents to report time spent out of school hours in the following activities: watching television/videos/DVDs, computer use, e-games and e-communication, study, reading, sitting with friends, telephone

use, listening or playing music, motorized travel, hobbies and crafts. The ASAQ has good validity and reliability compared to other self-report screen-time measures.⁵⁹

Self-efficacy

Scales of self-efficacy for PA based on SCT were designed for this study and reported elsewhere.⁵⁴ Self-efficacy was operationalized as an individual's confidence in personal ability to adopt and maintain PA behaviors and overcome barriers. The measure included eight items with a 6-point Likert scale ranging from 'strongly disagree' (1) to 'strongly agree' (6); for example, "I find it difficult to be physically active when I have no one to be active with". The mean for the six items was calculated to create a scale score (ranging from 1 to 6) for each individual. The psychometric properties of these scales were examined in a sample of Australian adolescents (N=171) which supported their validity and two-week test-retest reliability.⁵⁴

Perceptions of the environment

The questionnaire included six questions with a six-point Likert scale (1=disagree; 6=agree a lot) related to the environment (higher mean scores indicated a greater supportive environment). Both school and outside of school environments are independently associated with physical activity in youth.^{44,60} Therefore, three items were about aspects of the home and neighborhood environment, such as access to exercise equipment at home, access to places for PA (e.g. gym, backyard or garage), and safety from traffic. The other three items assessed the access to good PA facilities at school (e.g. gyms, ovals, dance studio, courts) and their availability during recess / lunch and after school hours. The survey items for the environment were validated and had good test-retest reliability.⁵⁴

Data analysis

Descriptive and exploratory statistical analyses were completed using PASW Statistics 17 (SPSS Inc. Chicago, IL) software and alpha levels were set at $p < 0.05$. A series of multi-level regression models were calculated to explore the association between outcomes using MLwin (version 2.02). Missing data were limited to less than 5% for any study variable. To adjust for the clustering of effects at the school level, two levels were defined in all of the analyses: 1) student and 2) school). SES and age were tested as potential confounding variables and were subsequently included as covariates in all of the models. To determine if the perceived environment mediated the relationship between self-efficacy and PA and sedentary behavior, a series of regression models were calculated (Figure 1). First, the association between self-efficacy and hypothesized mediators (i.e. home and school environment) were calculated using separate regression models (A-coefficient). Second, the associations between the potential mediators and PA/sedentary behavior (i.e. counts/minute, MVPA minutes/day, sedentary %, screen time minutes/day, were explored (B-coefficient). Finally, the asymmetric confidence intervals were calculated to test the significance of the product-of-coefficients (AB) using MacKinnon and colleagues PROduct Confidence Limits for INdirect effects (PRODCLIN) program.⁶¹ For a variable to satisfy the criteria for mediation, the 95% confidence intervals (CI) of the mediated effect (i.e. AB) must not include zero.

Results

Overview of study sample

Results are provided as means \pm standard deviations, unless otherwise noted (Table 1). Participants were 357 adolescent girls (13.2 ± 0.5 years) from 12 secondary schools. The majority of participants were born in Australia (97.8%), spoke English at home (98.6%), and

identified their cultural background as Australian (85.4%). A high percentage of participants were classified as overweight (26.1%) or obese (16.8%). The national prevalence of girls aged 14-16 years of age who are overweight or obese are 16 and 17 per cent respectively.⁶² Two hundred and fifty seven participants wore accelerometers for ≥ 600 minutes on at least three days. There were no statistical differences ($p < 0.05$) on the study variables between those who wore accelerometers and those who did not.

Association between PA, sedentary behavior and self-efficacy (C and C' coefficients)

Self-efficacy was not associated with PA (Table 2) or sedentary behavior (Table 3).

Association between self-efficacy and environment (A coefficient)

There was a positive significant association between self-efficacy and perceived home environment ($A = 0.36$, 95% CI = 0.24 to 0.48, $p < 0.05$) (Table 2). The association between self-efficacy and school environment was not significant.

Association between environment, PA and sedentary behavior (B coefficient)

The perceived environment was not associated with activity counts/minute or MVPA minutes/day (Table 2). Similarly, the home environment was not associated with self-reported screen time (Table 3), but there was a positive significant association between perceived school environment and sedentary behavior % ($B = 1.10$, 95% CI = 0.10 to 2.11, $p < 0.05$).

There were no statistically significant mediation effects for the cross-sectional relationship between self-efficacy and PA (Table 2) and sedentary behavior (Table 3).

Discussion

The first aim of this study, to examine whether perceptions of the school or the home environment mediated the relationship between PA self-efficacy and PA behavior, was not supported by the data. We hypothesized an association between PA self-efficacy and the

school environment. Interestingly, PA self-efficacy was associated with the home environment, but not with the school environment.

Research has found a positive relationship between home and school environments with PA in young people.²¹ However, in the present study the perceived home and school environments were not associated with PA behavior. As mentioned above, the schools examined for this study were recruited from areas of low socioeconomic status. Studies have found that deprived neighborhoods tend to have fewer or less attractive resources for PA than more affluent areas and this can partly explain socioeconomic differences in PA levels.⁶³⁻⁶⁹ Therefore, it could be that the lack of association with PA is attributable to an ‘actual’ and hence a ‘perceived’ low-level of resources in the disadvantaged schools and homes. Moreover, research has found that girls are generally less physically active than boys⁷⁰ and that this difference is particularly pronounced in adolescents from low SES backgrounds.^{40,71} Therefore, the fact that the sample of this study consisted of girls who were identified by their teachers as disengaged in PE and/or not participating in organized sports and who were from low socioeconomic areas, could have also contributed to the lack of association between environments and PA.

The association between self-efficacy and PA behavior was not statistically significant. However, the relationship approached significance. Research has found that the association between self-efficacy and PA behavior is stronger for self-reported PA than for objectively measured PA.^{72,73} This might partly be due to shared method variance which means that if two variables are measured the same way (i.e. both self-report) they are more likely to be correlated than if they are measured by two different methods (i.e. self-report vs. accelerometry).^{74,75} As well, previous studies indicate that the effect of self-efficacy on PA is stronger in boys than in girls.^{76,77} The present study used accelerometers to measure PA in

girls which might explain why the relationship between self-efficacy and PA did not reach statistical significance.

The second aim of this study, to examine whether perceptions of the home or school environment mediated the relationship between self-efficacy and sedentary behavior, was not supported by the data. Interestingly, there was a significant positive association between the perceived school environment and sedentary behavior (from accelerometry data). This seems counter-intuitive as poorer environments for PA would be expected to yield increased sedentary behavior time. As stated before, very little research has been conducted on the relationship between physical environments and sedentary behavior. However, similar to our finding, a recent study from Belgium reported neighborhood walkability was positively associated with self-reported and objectively measured sedentary behavior.⁷⁸ Further research is needed to explore the association between the environment and sedentary behavior and mechanisms that might operate in this relationship.

Several studies with youth have reported significant negative associations between screen time use and physical activity levels in children and youth.⁷⁹⁻⁸¹ The ‘displacement hypothesis’ has been offered as a potential explanation for such findings whereby time using screen devices may compete with, or be a substitute for, social and physical activities.⁸² Although this hypothesis remains controversial, it may be the time period (e.g., immediately after school) at which individuals are sedentary that is of most concern.

Only a small proportion of studies using objective PA measures have been successful in showing the relationships between physical environments and PA and sedentary behaviors in young people.²² Adolescent girls are a unique population as their PA declines and their sedentary behavior increases dramatically during this time of youth.^{62,83} This sample was also unique as the group of girls was identified by their teachers as disengaged in PA. Furthermore, the participants were from socioeconomically disadvantaged areas; data from

this specific target group have been limited. Girls might not view their school environment as a place for PA and physical environments may be less important for adolescent girls. For this specific target group the social environment (peers, teachers, etc.) may be more important than the physical environment. School-based programs and policies may need to consider such factors in motivating girls to be physically active.

A number of study strengths, however, include: (1) the specificity of the target population i.e., adolescent girls disengaged in PA living in deprived areas; (2) the objective measurement of PA which provides higher validity than self-reported data; and, (3) the sophisticated analyses which adjusted for school-level clustering and explored cross-sectional mediators. However the use of single mediator models (i.e., examining each of the environmental constructs independently rather than including both environmental measures in the analyses) is a potential limitation which may have biased the findings. The cross-sectional design is a further limitation. Although the temporal sequencing architecture of Bandura's SCT is well-supported²⁸ it could be argued from a social-ecological perspective, that the tested models may work the other way i.e., self-efficacy could mediate the relationship between the perceived environment and PA; and/or these relationships may be bidirectional in nature. Longitudinal designs are warranted to further understand the mechanisms between these constructs in this target population.

In summary, the mediated model was not supported for PA or sedentary behavior. However, other results of this paper may be helpful for future theory development and practice. More research is needed to understand behaviors in unique populations such as disengaged adolescent girls from low SES environments.

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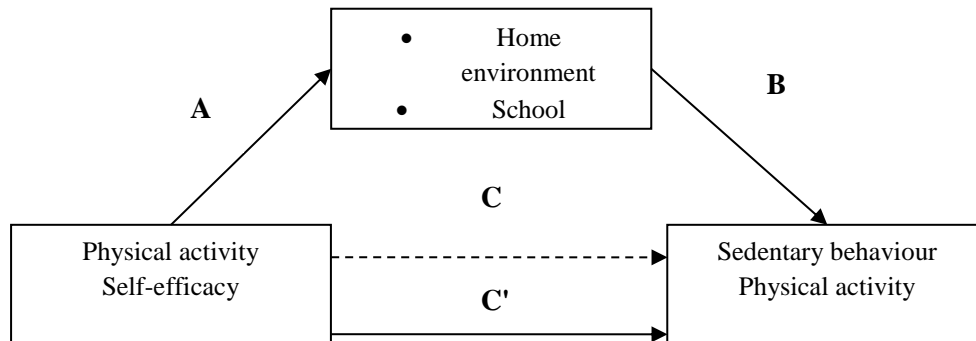
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Figure 1: Conceptual model: School and home environment as mediators of the relationship between PA self-efficacy and sedentary behavior and PA



Adapted from Bandura et al. (2004) (87)

Table 1: Characteristics of the study population (N = 357)

Variable	Mean	SD
<i>Demographics</i>		
Age (years)	13.2	0.5
Country of birth, <i>n</i> (%) ¹	349	97.80%
SES ²	4.3	1.8
Language spoken at home, <i>n</i> (%) ³	352	98.60%
Cultural background ⁴		
Australian, <i>n</i> (%)	305	85.40%
Asian, <i>n</i> (%)	4	1.10%
European, <i>n</i> (%)	36	10.10%
Other, <i>n</i> (%)	11	3.10%
<i>Anthropometrics</i>		
Weight (kg)	58.4	13.9
Height (m)	1.6	0.07
BMI (kg/m ²)	22.6	4.6
BMI <i>z</i> -score	0.8	1.14
BMI Category		
Underweight, <i>n</i> (%)	2	0.60%
Healthy weight, <i>n</i> (%)	202	56.60%
Overweight, <i>n</i> (%)	93	26.10%
Obese, <i>n</i> (%)	60	16.80%
BIA (body fat %)	28.9	6.7
<i>Physical activity and sedentary behavior</i>		
Counts per minute (mean/day)	402.6	131.8
Sedentary time (%)	62.1	7.6
Screen time (mins/day)	273.2	166.6
TV (mins/day)	125.4	82.2
DVD (mins/day)	53.7	51.7
Computer (mins/day)	93.7	95.5
<i>Self-reported variables</i>		
Physical activity self-efficacy	3.86	0.97
Perceived home environment	4.67	0.92
Perceived school environment	3.73	0.90

Note. SD = standard deviation; BMI = body mass index; BIA = bioelectrical impedance analysis; MVPA = moderate-to-vigorous PA minutes per day; mins = minutes.

¹Participants born in Australia

²SES = socio-economic status based on the Socio-Economic Indexes for Areas (SEIFA) index of relative socioeconomic advantage and disadvantage (scale 1 = lowest to 10 = highest).

³Participants who speak English at home.

⁴One participant did not report their cultural background.

⁵N = 252 participants wore accelerometers for ≥ 600 minutes on ≥ 3 days

Table 2: Cross-sectional mediation analysis for the association between self-efficacy, perceived environment and physical activity

	Self-efficacy and environment				Environment and physical activity				Self-efficacy and physical activity*				Mediated effect		
			95% CI				95% CI				95% CI		95% CI		
	A	SE	Lower	Upper	B	SE	Lower	Upper	C'	SE	Lower	Upper	AB	Upper	Lower
<i>Activity (counts/min)</i>															
Home environment	0.36	0.06	0.24	0.48	-13.85	9.39	-18.17	4.55	16.26	9.24	-1.85	34.37	-4.92	-12.09	1.50
School environment	0.06	0.06	-0.06	0.19	-16.41	8.68	-17.07	0.60	12.58	8.62	-4.32	29.48	-1.06	-3.85	0.83
<i>MVPA (min/day)</i>															
Home environment	0.36	0.06	0.24	0.48	-1.94	1.24	-2.20	0.49	1.95	1.22	-0.44	4.34	-0.69	-1.64	0.16
School environment	0.06	0.06	-0.06	0.19	-1.30	1.15	-2.31	0.95	1.35	1.14	-0.88	3.59	-0.08	-0.36	0.09

Note. All models adjusted for age and SES.

^a A = unstandardized regression coefficient of self-efficacy predicting hypothesized mediators (i.e. perceived environment).

^b B = unstandardized regression coefficient of the hypothesized mediator predicting PA with treatment self-efficacy included in the model

^c C' = unstandardized regression coefficient of self-efficacy predicting PA with mediator in the model.

^d 95% CI = 95% confidence interval of the mediated effect from PRODCLIN ; AB = product-of-coefficients estimate.

MVPA (%) = percentage time spent in moderate-to-vigorous PA.

Results in bold are significant at the $p < 0.05$ level.

* Total effect of self-efficacy on PA: MVPA mins per day C=1.27, SE=1.42 (95% CI=4.05,-1.52); Activity counts per min C=11.39, SE=8.65 (95% CI=28.33,-5.55)

Table 3: Cross-sectional mediation analysis for the association between self-efficacy, perceived environment and sedentary behavior

	Self-efficacy & environment				Environment & sedentary behavior				Self-efficacy & sedentary behavior*				Mediated effect		
	95% CI				95% CI				95% CI				95% CI		
	A	SE	Lower	Upper	B	SE	Lower	Upper	C'	SE	Lower	Upper	AB	Upper	Lower
<i>Sedentary (%)</i>															
Home environment	0.36	0.06	0.24	0.48	0.60	0.55	-0.48	1.68	-0.62	0.54	-1.68	0.44	0.21	-0.16	0.62
School environment	0.06	0.06	-0.06	0.19	1.10	0.51	0.10	2.11	-0.46	0.51	-1.45	0.54	0.07	-0.06	0.25
<i>Screen time (mins/day)</i>															
Home environment	0.36	0.06	0.24	0.48	-1.74	11.35	-23.98	20.51	-20.65	11.12	-42.45	1.15	-0.62	-8.68	7.35
School environment	0.06	0.06	-0.06	0.19	-12.79	10.43	-33.23	7.65	-20.29	10.40	-40.67	0.09	-0.83	-3.42	0.79

Note. All models adjusted for age and SES.

^a A = unstandardized regression coefficient of self-efficacy predicting hypothesized mediators (i.e. perceived environment).

^b B = unstandardized regression coefficient of the hypothesized mediator predicting sedentary behavior with treatment self-efficacy included in the model.

^c C' = unstandardized regression coefficient of self-efficacy predicting sedentary behavior with mediator in the model.

^d 95% CI = 95% confidence interval of the mediated effect from PRODCLIN. ; AB = product-of-coefficients estimate.

Models adjusted for age and SES.

Results in bold are significant at the $p < 0.05$ level.

* Total effect of self-efficacy on PA: Sedentary time (%) C=-0.41, SE=0.50 (95% CI=0.58,-1.40); Screen-time mins/day C=-20.90, SE=10.45 (95% CI=-0.42,-41.38)